PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference A4-144 CIP PCT	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/US2005/002809	International filing date *(day/month/year)* 02.02.2005	Priority date *(day/month/year)* 02.02.2004
International Patent Classification (IPC) or national classification and IPC INV. H01R12/20		
Applicant MOLEX INCORPORATED		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 5 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
24.08.2005	09.05.2006
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer Corrales, D Telephone No. +31 70 340-2645

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US2005/002809

Box No. I Basis of the report

1. With regard to the **language**, this report is based on

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3(a) and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4(a))
   - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages	
1-24	as originally filed
Claims, Numbers	
1-37	filed with telefax on 01.08.2005
Drawings, Sheets	
1/22-22/22	as originally filed

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☒ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☒ the claims, Nos. 38, 39
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US2005/002809

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-37
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-37
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-37
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document:
D1: US-A-5 437 562 (MICHAEL ET AL) 1 August 1995 (1995-08-01)

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses:

A connector for connecting a cable to a printed wiring board comprising a dielectric housing; a conductive signal contact mounted on said housing and adapted for mating with a signal conductor of the of the cable.

The subject-matter of claim 1 therefore differs from this known connector in that: a spring connector is connected to the housing, a receptacle defined between said spring connector and said housing, said spring connector having a deflectable arm for causing said signal contact on said housing to electrically connect to a signal contact on the printed wiring board when the printed wiring board is inserted into said receptacle.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may therefore be regarded as providing a connector which allows easy insertion and removal of a larger size range of printed wiring boards.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:
Although changing the contact of D1 to a deflectable contact might seem obvious, adding a spring connector is not obvious nor suggested, and allows the connector to be used with a wider range of board thickness as well as replacement of only the spring connector when necessary, without having to change the whole connector.

Claims 2-37 are dependent on claim 1 and as such also meet the requirements of the PCT

with respect to novelty and inventive step.

THE INVENTION CLAIMED IS:

1. A connector for connecting a cable to a printed wiring board comprising:

a dielectric housing;

a conductive signal contact mounted on said housing and adapted for mating with a signal conductor of the cable; and

a spring connector connected to said housing, a receptacle defined between said spring connector and said housing, said spring connector having a deflectable arm for causing said signal contact on said housing to electrically connect to a signal contact on the printed wiring board when the printed wiring board is inserted into said receptacle.

2. A connector as defined in claim 1, wherein said spring connector is a separate member from said housing, such that said spring connector can be engaged and disengaged from said housing, said spring connector including a body and said deflectable arm is provided in said body.

3. A connector as defined in claim 2, wherein said deflectable arm is curved in an unflexed position.

4. A connector as defined in claim 2, further including a ground shield attached to said housing, said spring connector including ground means for connecting said ground shield to a ground contact on the printed wiring board.

5. A connector as defined in claim 4, wherein said ground means comprises a conductive ground terminal provided in said body.

6. A connector as defined in claim 5, wherein a portion of said ground terminal is capable of flexing relative to said body when the connection between said ground shield and the ground terminal on the printed wiring board is made.

7. A connector as defined in claim 5, wherein said ground terminal is electrically isolated from said signal terminal in said body.

8. A connector as defined in claim 1, further including a ground shield attached to said housing and said deflectable arm is formed as part of said ground shield.

9. A connector as defined in claim 8, wherein said deflectable arm has a dimple thereon for engagement with a ground terminal on the printed wiring board.

10. A connector as defined in claim 1, wherein said receptacle provided has openings on two sides thereof into which the printed wiring board can be inserted.

11. A connector as defined in claim 10, wherein said signal contact is mounted at approximate the centerpoint of the receptacle.

12. A connector as defined in claim 1, further including a ground shield attached to said housing.

13. A connector as defined in claim 12, wherein said signal contact is generally mounted at approximate the centerpoint of the receptacle.

14. A connector as defined in claim 13, further including ground contacts provided on said housing on opposite sides of said signal contact and means for connecting said ground contacts with said ground shield.

15. A connector as defined in claim 14, further including a conductive layer provided between the housing and said ground shield.

16. A connector as defined in claim 12, wherein said ground shield includes an opening through which the cable is inserted, said opening having a first section which is larger than the cable to allow the cable to be freely inserted therein and second section which is smaller than the cable into which the cable can be inserted, thereby causing a secure connection between a ground conductor of the cable and said ground shield.

17. A connector as defined in claim 16, further including a tapered section between said first and second sections of said opening.

18. A connector as defined in claim 12, wherein said ground shield includes a pair of wings capable of being attached to a guide rail in a device.

19. A connector as defined in claim 18, wherein said wings have convolutions thereon.

20. A connector as defined in claim 1, wherein said signal contact is generally T-shaped.

21. A connector as defined in claim 20, further including a ground shield attached to said housing and ground contacts provided on said housing on opposite sides of said T-shaped signal contact, said ground contacts being electrically connected to said ground shield.

22. A connector as defined in claim 1, wherein said housing includes a passageway therein into which at least a portion of the cable is inserted.

23. A connector as defined in claim 22, wherein said signal contact extends into said passageway.

24. A connector as defined in claim 22, wherein said passageway includes a plurality of ribs therein for gripping the cable.

25. A connector as defined in claim 22, further including a ground shield attached to said housing.

26. A connector as defined in claim 25, wherein a portion of said passageway has a conductive material therein, said conductive material being electrically connected to said ground shield.

27. A connector as defined in claim 25, wherein a portion of said passageway has a conductive material therein, and a portion of said housing has a conductive material thereon, said conductive material in said passageway being electrically connected to said conductive material on said housing, and said conductive material on said housing being electrically connected to said ground shield.

28. A connector as defined in claim 22, wherein said housing is formed by first and second bodies which are joined together.

29. A connector as defined in claim 28, further including a ground shield which joins said first and second bodies together.

30. A connector as defined in claim 29, wherein said ground shield includes a pair of arms for joining said first and second bodies together.

31. A connector as defined in claim 29, wherein said ground shield includes a pair of wings capable of being attached to a guide rail in a device, said wings including convolutions thereon.

32. A connector as defined in claim 1, further including at least one protrusion formed of a dielectric material on the housing proximate to the signal contact.

33. A connector as defined in claim 1, further including a ground shield; said dielectric housing being connected to said ground shield; and a pair of ground contacts mounted symmetrically on the housing and electrically connected to the ground shield.

34. A connector as defined in claim 33, further including a plurality of plated through apertures provided through the housing for providing the electrical connection from the ground contacts to the ground shield.

35. A connector as defined in claim 33, wherein the signal contact is generally centrally located on the housing.

36. A connector as defined in claim 1, wherein said deflectable arm biases the printed wiring board against said signal contact mounted on said housing.

37. A connector as defined in claim 36, further including a ground shield, said dielectric housing being connected to said ground shield, and a pair of ground contacts mounted symmetrically on the housing and electrically connected to the ground shield; and wherein when said deflectable arm biases the printed wiring board, a ground contact on the printed wiring board is engaged against one of said ground contacts mounted on said housing.